

Attorney Docket No.: DRE0166US
Inventors: Ko et al.
Serial No.: 10/577,709
Filing Date: August 18, 2006
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REMARKS

Claims 1-5 are pending in the instant application. Claims 1-5 have been rejected. Claims 6 through 13 have been added. Support for these claims is provided in teachings of the specification at pages 5-6. No new matter is added by these amendments. Reconsideration is respectfully requested in light of these amendments and the following remarks.

I. Objection to Specification

The specification has been objected to for two spelling errors and an error in punctuation. Accordingly, Applicants have amended the specification to correct these inadvertent typographical errors. Two inadvertent errors in reference citations have also been corrected. The correct reference citations were provided in the Information Disclosure Statement considered by the Examiner. No new matter is added by these amendments. Entry of these amendments and withdrawal of the objection is respectfully requested.

II. Rejection of Claims 1-5 under 35 U.S.C. 103(a)

Claims 1-5 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Gould (materialstoday).

Applicants respectfully traverse this rejection.

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At the outset, it is respectfully pointed out that the Gould reference was published in December of 2002, less than a year before the priority date of the instant application. Further, the teaching in Gould at page 47, 5th paragraph, which the Examiner relies upon in making this rejection is a quote from a co-inventor of the instant application, Dr. Frank Ko. Accordingly, this review article cannot be considered a teaching by another and thus does not constitute a valid prior art reference with respect to the instant patent application.

Further, as acknowledged by the Examiner, no where does this reference teach carbon nanotubes. Nor can the vague quote by Dr. Ko that "Electromagnetic, magnetic, biological and structural functions of the fibers can be tailored by using different types of particle and the mount of the particle," be considered a suggestion of carbon nanotubes without the benefit of hindsight provided by the instant application.

Accordingly, teachings of Gould fail to provide the required teaching or suggestion of all claim limitations of claim 1 drawn to a synthetic fibril comprising carbon nanotube and spider silk or silkworm silk or claims dependent therefrom. Further, teachings of Gould provide no reasonable expectation of success that fibrils comprising carbon nanotube and spider silk or silkworm silk can be

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synthesized, particularly by electrospinning, and used successfully in biomedical devices, blast or ballistic protection devices and electroconducting fibers in accordance with claims 1 through 5.

Further, in accordance with teaching of the specification at pages 5 and 6, Applicants have added new claims 6 through 9 drawn to a synthetic fibril comprising about 1% to about 10% by weight carbon nanotube and spider silk or silkworm silk electrospun from a silk solution comprising approximately 8% to about 20% by weight of the spider silk or silkworm silk and devices or fibers thereof and new claims 10-13 drawn to a synthetic fibril comprising carbon nanotubes treated with a surfactant or a dispersion agent and spider silk or silkworm silk and devices or fibers thereof.

Gould clearly fails to provide the required teaching or suggestion of all claim limitations of new claims 6-13 as well.

Accordingly, claims 1 through 13 are unobvious over teachings of Gould.

Withdrawal of this rejection under 35 U.S.C. 103(a) is respectfully requested.

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III. Rejection of Claims 1 and 3-5 under 35 U.S.C. 103(a)

Claims 1 and 4 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Goldstein (U.S. Patent 6,126,888) in view of Applicants admitted prior art. The Examiner has acknowledged that Goldstein does not disclose spider or silkworm silk or a blast or ballistic protection device. However, the Examiner suggests that spider silk is a well known high strength silk, as evidenced by the prior art disclosed in the instant specification. Further, the Examiner suggests that blast or ballistic protection devices are merely known uses of silk fibers. Thus, the Examiner suggests that it would have been obvious to one of ordinary skill in the art to modify the composite fiber of Goldstein with the spider silk and intended use of Applicants' admitted prior art because there was a reasonable expectation of success.

Claims 3 and 5 has also been rejected under 35 U.S.C. 103(a) as being unpatentable over Goldstein (U.S. Patent 6,126,888) in view of Applicants' admitted prior art, and further in view of Smalley et al. (US 2003/0170166). The Examiner suggests that Smalley discloses carbon nanotubes as possible strengthening reinforcement in composite materials which can be applied in biologically compatible devices.

Applicants respectfully traverse these rejections.

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Teachings of Goldstein are drawn to methods for making very strong gas mantles and other ceramic structures. Accordingly, Applicants respectfully disagree that one of skill would have been motivated to modify the composite fiber of Goldstein with spider silk based upon its recognized properties as a wonder fiber for its unique combination of high strength and rupture elongation. In no way would the rupture elongation properties of spider silk be a motivation to incorporate this fiber into the gas mantles and ceramic structures of Goldstein. Nor is use of either the fibers of Goldstein or the unique fibers of the present invention in ballistic protection suggested by Goldstein.

Teachings of Smalley et al. fail to remedy deficiencies in the combined teachings of Goldstein and the admitted prior art as this reference also provides no teaching or suggestion of combining a spider or silkworm silk with carbon nanotubes.

Accordingly, teachings of Goldstein combined with the admitted prior art and further combined with Smalley et al. provide no reasonable expectation of success that fibrils comprising carbon nanotube and spider silk or silkworm silk can be synthesized, particularly by electrospinning, and used successfully in biomedical devices, blast or ballistic

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protection devices and electroconducting fibers in accordance with claims 1 through 5.

Further, in accordance with teaching of the specification at pages 5 and 6, Applicants have added new claims 6 through 9 drawn to a synthetic fibril comprising about 1% to about 10% by weight carbon nanotube and spider silk or silkworm silk electrospun from a silk solution comprising approximately 8% to about 20% by weight of the spider silk or silkworm silk and devices or fibers thereof and new claims 10-13 drawn to a synthetic fibril comprising carbon nanotubes treated with a surfactant or a dispersion agent and spider silk or silkworm silk and devices or fibers thereof.

Goldstein combined with the admitted prior art and further combined with Smalley et al. clearly fail to provide the required teaching or suggestion of all claim limitations of new claims 6-13 to render obvious these claims.

Accordingly, claims 1 through 13 are unobvious over teachings of Goldstein combined with the admitted prior art and teachings of Goldstein combined with the admitted prior art and further in view of Smalley et al.

Withdrawal of these rejections under 35 U.S.C. 103(a) is respectfully requested.

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IV. Rejection of Claims 1-5 under 35 U.S.C. 103(a)

Claims 1 and 4 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Glatowski et al. (U.S. Patent 6,265,466) in view of Applicants' admitted prior art. The Examiner has acknowledged that Glatowski does not disclose spider or silkworm silk or a blast or ballistic protection device. However, the Examiner suggests that spider silk is a well known high strength silk, as evidenced by the prior art disclosed in the instant specification. Further, the Examiner suggests that blast or ballistic protection devices are merely known uses of silk fibers. Thus, the Examiner suggests that it would have been obvious to one of ordinary skill in the art to modify the composite fiber of Glatowski with the spider silk and intended use of Applicants' admitted prior art because there was a reasonable expectation of success.

Claims 2 and 5 have also been rejected under 35 U.S.C. 103(a) as being unpatentable over Glatowski et al. (U.S. Patent 6,265,466) in view of Applicant's admitted prior art and further in view of Senecal et al. (US 2001/0045547).

Claim 3 has also been rejected under 35 U.S.C. 103(a) as being unpatentable over Glatowski et al. (U.S. Patent 6,265,466) in view of Applicant's admitted prior art and further in view of Smalley et al. (US 2003/0170166).

Applicants respectfully traverse these rejections.

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Teachings of Glatowski et al. relate to methods for making electromagnetic shielding composites. Accordingly, Applicants respectfully disagree that one of skill would have been motivated to modify the composite fiber of Glatowski et al. with spider silk based upon its recognized properties as a wonder fiber for its unique combination of high strength and rupture elongation. In no way would the rupture elongation properties of spider silk be a motivation to incorporate this fiber into electromagnetic shielding composites. Nor is use of either the fibers of Glatowski or the unique fibers of the present invention in ballistic protection suggested by Glatowski.

Teachings of either Senecal et al. or Smalley et al. fail to remedy deficiencies in the combined teachings of Glatowski et al. and the admitted prior art as these reference also provide no teaching or suggestion of combining a spider or silkworm silk with carbon nanotubes.

Accordingly, teachings of Glatowski et al. combined with the admitted prior art and further combined with Senecal et al. or Smalley et al. provide no reasonable expectation of success that fibrils comprising carbon nanotube and spider silk or silkworm silk can be synthesized, particularly by electrospinning, and used successfully in biomedical devices, blast or ballistic

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protection devices and electroconducting fibers in accordance with claims 1 through 5.

Further, in accordance with teaching of the specification at pages 5 and 6, Applicants have added new claims 6 through 9 drawn to a synthetic fibril comprising about 1% to about 10% by weight carbon nanotube and spider silk or silkworm silk electrospun from a silk solution comprising approximately 8% to about 20% by weight of the spider silk or silkworm silk and devices or fibers thereof and new claims 10-13 drawn to a synthetic fibril comprising carbon nanotubes treated with a surfactant or a dispersion agent and spider silk or silkworm silk and devices or fibers thereof.

Glatowski et al. combined with the admitted prior art and further combined with Senecal et al. or Smalley et al clearly fail to provide the required teaching or suggestion of all claim limitations of new claims 6-13 to render obvious these claims.

Accordingly, claims 1 through 13 are unobvious over teachings of Glatowski combined with the admitted prior art, teachings of Glatowski combined with the admitted prior art and further in view of Smalley et al., and teachings of Glatowski combined with the admitted prior art and further in view of Senecal.

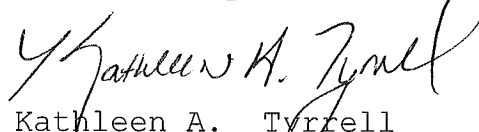
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Withdrawal of these rejections under 35 U.S.C. 103(a)
is respectfully requested.

V. Conclusion

Applicants believe that this submission overcomes all
pending rejections in this case and comprises a full and
complete response to the Office Action of record.
Accordingly, favorable reconsideration and subsequent
allowance of the pending claims is earnestly solicited.

Respectfully submitted,


Kathleen A. Tyrrell
Registration No. 38,350

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LICATA & TYRRELL P.C.
66 E. Main Street
Marlton, New Jersey 08053

(856) 810-1515